

SOUDEK

Effect of the crystalline structure on optical and photoelectric properties of the phthalocyanine free from metal. Slaboprudy obzor 24 no.1:44 Ja '63.

SOUDEK.

Photoelectric properties of the arsenic selenide. Slaboproudy obsor  
24 no.3:174-175 Mr '63.

SOUDEX

Reversal effects of ionizing radiation on electric properties  
of dielectrics. Slaboproudy obzor 24 no.4:245-246 Ap '63.

SOUDER

Influence of temperature on photocells with electron multiplier.  
Slabproudy obzor 24 no.4:237 Ap '63.

SOUDEK

Examination of electric charges originating in polymer  
deformation. Slaboproudny obzor 25 no. 2: 102 F '64.

SOUDEK, D., doktor.

"New trends in biology." R. Moravec. Reviewed by D. Soudek.  
Chekh. biol. 2 no. 1: 63-64 Ap '53. (MLRA 7:2)  
(Biology) (Moravec, Radim)

SOUDEK, D.

New type of a rapid homogenizer for small quantities of tissues.  
Chekh.biol. 2 no.4:242-245 Ag '53. (MLRA 7:4)

1. Institut obshchey biologii meditsinskogo fakul'teta universiteta  
im. Masarika, Brno.  
(Scientific apparatus and instruments) (Tissue culture)



SOUDEK, D.; BENESH, L.

Protein composition of cell nuclei. *Fol.biol., Praha* 1 no.5:261-267  
Oct 55.

1. ~~Tsitolofarmakologicheskaya~~ laboratoriya farmatsevticheskogo  
fakul'teta i Biologicheskii institut meditsinskogo fakul'teta univer-  
siteta v Brno.

(CELL NUCLEUS,  
protein composition)

(PROTEINS,  
in cell nucleus)



Soudek

CZECHOSLOVAKIA / General Division, History, Classics,  
Personnel

A-2

Abs Jour: Ref Zhur-Biologiya, No 5, 1958, 18841

Author : Soudek Dusan

Inst : -

Title : On the Fiftieth Year of Professor Dr. Ferdinand  
Hercik

Orig Pub: Ceskosl. biol., 1955, 4, No 6, 384

Abstract: A short survey of the scientific activity of the  
Czech biologist Hercik (born, 1905), who studied ques-  
tions of the surface tension of cell fluid ( a meno-  
graph in 1934), the action of X-rays (20 works  
published) and others. In later years Hercik con-  
ducted research on bacteriophage and showed that  
the phage is formed directly from the contents of  
the cell. A state prize was awarded to him in 1954  
for his monograph "The Problem of Bacteriophage".

Card 1/ 1

SOUDEK, Dusan; BENES, Iamir.

Protein composition of membrane of cell nucleus. Cesk.biol.  
4 no.7:416-421 J1 '55.

1. Cytofarmakologicka laborator farmaceuticke fakulty a  
biologicky ustav lekarske fakulty university v Brne.

(CELL NUCLEUS,  
protein composition)  
(PROTEINS,  
in cell nucleus)

CZECHOSLOVAKIA / General Biology. Cytology. General B  
Cytology.

Abs Jour : Ref Zhur - Biologiya, No 4, 1959, No. 14297

Author : Soudek, D.

Inst : Not given

Title : The Genesis of "Cells" from Pulverized  
Organisms by Coacervation

Orig Pub : Folia biol. (Ceskosl.), 1957, 3, No 4,  
252-256

Abstract : No abstract given

Card 1/1

SOUDEK, D.

Origin of "cells" through concervation of biocolloids from homogenized organisms.

p. 292 (Ceskoslovenska Biologie) Vo.. 6, no. 4, July 1957. Praha, Czechoslovakia.

SO: Monthly Index of East European Accessions (EEAI) LC, Vol. 7, no. 1, Jan1958

SOUDEK, D.: STRANSKA, E.

Phenomena of the growing activity in the nucleus of Basimobolus ranarum  
Eidem. p. 327.

Praha, Czechoslovakia. Vol. 7, no. 5, Sept. 1958.

Monthly List of East European Accessions q(EZAI) , LC. Vol. 9, no. 2.  
Feb. 1960.

Uncl.

NECAS, O.; HAVELKOVA, Marie; SOUDEK, D.

Submicroscopic morphology of *Rhizopus nigricans*. *Folia microbiol.*  
8 no.5:290-292 '63.

1. Department of Biology, Medical Faculty, Purkyne University,  
Brno.

(RHIZOPUS) (CYTOLOGY) (MICROSCOPY, ELECTRON)

SOUDEK, D.; KOUKALOVA, Blazena

The insoluble component of nuclear membranes. II. The effect of enzymes on the trypsin-resistant component of nuclear membrane. Folia biol. (Praha) 9 no.6:444-446 '63.

1. Department of Biology, Former Faculty of Pharmacy, and Department of Biology, Faculty of Medicine, Purkyne University, Brno.

(CELL NUCLEUS) (PHOSPHOLIPASE) (LIPASE)  
(SURFACE-ACTIVE AGENTS) (TRYPSIN)



SOUDEK, D.; NECAS, O.

The insoluble component of nuclear membrane. III. Electron  
microscopy of ultrathin sections. Folia biol. (Praha) 9 no.6:  
447-451 '63.

1. Department of Biology, Faculty of Medicine, Purkyne University,  
Brno.

(CELL NUCLEUS) (MICROSCOPY, ELECTRON)  
(LIVER CYTOLOGY) (TRYPSIN) (ALKALIES)

SOUDEK, I.

Electromechanical Q-meter. p. 40.

Vol. 14, no. 1, Jan. 1953  
SLABOPROUDY OBZOR  
Praha, Czechoslovakia

So: Eastern European Accession Vol. 5 No. 4 April 1956

SOUDEK, I. - Vol. 14, no. 4, Apr. 1953. SLABOPROUDY OBZOR.

A. Bonc and Z. Brusvich's article "Simple Laboratory Oscillator for Generating Rectangular Impulses"; an abstract. p. 188.

SO: Monthly list of East European Accessions, (REAL), LC, Vol. 4, No. 9, Sept. 1955  
Uncl.

SOUDEK, I.

Thermal dependence of the photoluminescence intensity of zinc cadmium sulfide.  
p. 594. (CESKOSLOVENSKY CASOPIS PRO FYSIKU, Vol. 6, No. 5, Sept 1956, Praha.  
Czechoslovakia)

SO: Monthly List of East European Accessions (EEAL) LC, Vol. 6, No. 12, Dec 1957. Uncl.

*SOUDEK I.*

CZECHOSLOVAKIA/Optics - Luminescence

K-6

Abs Jour : Ref Zhur - Fizika, No 2, 1958, No 4523

Author : Soudek I.

Inst : Not Given

Title : Measurement of Physical and Optical Properties of Luminescent Materials.

Orig Pub : Jemna mech. a opt., 1957, 2, No 3, 83-88

Abstract : Popular article.

Card : 1/1

Soudak, I.

Distr: 4E3d/4E4c

Temperature dependence of the intensity of photo-luminescence of zinc sulfide-cadmium sulfide phosphor.  
Ivan Soudak. Czechoslov. J. Phys. 7, 1141 (1957) (in Russian).  
 —A ZnS-CdS phosphor showed the following phenomena: on heating, the intensity of the luminescence decreases step-wise, while between the regions of rapid decrease (50-150° and 260-320°) lies a region where the decrease is noticeably less. On cooling, these steps are less pronounced while in the interval between them, the intensity is higher than on heating although on cooling to room temp., the intensity is distinctly less than before the beginning of the test. At the end of the 1st period (about 170°) the color of the luminescence changes from yellow to red on heating and the reverse on cooling. Several possible explanations are discussed but none are satisfactory. V. H. Gossomak

RM JR

Soudek, Ivan

Effect of irradiation on the dielectric losses of luminescent zinc-cadmium sulfide. Ivan Soudek, *Czechoslov. J. Phys.* 7, 119-20 (1957) (in English). It is known that the dielectric losses of luminescent materials increase on irradiation, but the spectral dependence is not known. Luminescent Zn-CdS (50% CdS) activated by Ag, was irradiated through Schott filters GG4, GG10, OG3, and RG8 (2 mm. thick), which transmitted 60% of the incident radiation. The equiv. parallel resistance (in kilohms) at 433, 475, 600, and 694 mμ, is shown with 1 point measured without filter, and another point without irradiation. All measurements were made at a frequency of 105 kc./sec.; under these conditions, the capacity is independent of the irradiation (278-83 picofarad). V. H. Gottschalk



CZECHOSLOVAKIA/Optics - Luminescence

K-6

Abs Jour : Ref Zhur - Fizika, No 4, 1959, No 6772

Author : Soudek Ivan

Inst : -

Title : Dependence of Afterglow of Luminescence on the Thickness of the Specimen.

Orig Pub : Ceskosl. casop. fys., 1957, 7, No 6, 709-711

Abstract : See Abstract 6771.

Card : 1/1

STUDEL, I.

Colorimetry and its importance for television.

C. 508 (Slaboproudý Obzor. Vol. 18, no. 7, July 1957. Praha, Czechoslovakia)

Monthly Index of East European Accessions (EEAI) LC. Vol. 7, no. 2,  
February 1958

SOUDEK, IVAN

CZECHOSLOVAKIA/Optics - Luminescence

K-6

Abs Jour : Ref Zhur - Fizika, No 6, 1958, No 14275

Author : Soudek Ivan

Inst : Not Given

Title : Luminescence of Crystals and Its Application in High Frequency Engineering

Orig Pub : Slaboproudy obzor, 1957, 18, No 10, 715-721

Abstract : Survey. Bibliography, 88 titles.

Card : 1/1

27

Orig Pub : Ceskosl. casop. fys., 1958, 8, No 1, 77-88

APPROVED FOR RELEASE: 08/23/2000 1959, No 2, 4294.

CIA-RDP86-00513R001652620004-5"

Card 1/1

CZECHOSLOVAKIA/Optics - Luminescence

K-6

Abs Jour : Ref Zhur - Fizika, No 4, 1959, No 6774

Author : Soudek Ivan

Inst : -

Title : Dependence of the Spectral Composition of the Luminescence of  
Zinc-Cadmium Sulfides on the Excitation Intensity

Orig Pub : Ceskosl. casop. fys., 1958, 8, No 3, 315-318

Abstract : See Abstract 6773

Card : 1/1

K-6

CZECHOSLOVAKIA/Optics - Luminescence

Abs Jour : Ref Zhur - Fizika, No 4, 1959, No 6771

Author : Soudek Ivan

Inst : ~~Research~~ Institute for Vacuum Electronics, Prague, Czechoslovakia

Title : Dependence of Afterglow of Luminescence on the Thickness of the Specimen

Orig Pub : Chekhosl. fiz. zh., 1958, 8, No 3, 332-335

Abstract : An increase was observed in the duration of the afterglow of the phosphors (Zn:Ca) S-Ag and (Zn:Ca)S-Cu, at increased specimen thickness. The dependence of the afterglow on the thickness of the specimen has a somewhat different character than the dependence on the intensity of excitation. It is assumed that the observed phenomenon is connected with the transition of electrons between the individual crystalline grains. -- Ya.Ya. Kirs

Card : 1/1

99

K-6

CZECHOSLOVAKIA/Optics - Luminescence

Abs Jour : Ref Zhur - Fizika, No 4, 1959, No 6773

Author : Seudek Ivan  
Inst : Research Institute for Vacuum Electronics, Prague, Czechoslovakia

Title : The Dependence of the Spectral Composition of the Luminescence of Zinc-Cadmium Sulfides on the Excitation Intensity

Orig Pub : Chekhosl. fiz.-zh., 1958, 8, No 3, 336-340

Abstract : A shift in the radiation bands of the phosphors ZnS-Ag, ZnS-Cu, and (Zn:Cu)S-Ag has been observed towards the shorter waves upon increased intensity of the exciting light. To explain the observed phenomena it is assumed that the levels of the activator fill a definite band of values of energy, in which the excited state can shift from the deeper states towards the higher migrations of holes. Repeated excitation of short-wave centers occurs at higher excitation intensity more rapidly than the excitation of long-wave centers, caused by the motion of the holes. -- Ya.Ya. Kirs

Card : 1/1

100

AUTHOR: Soudek, Ivan

CZECH/37-59-3-4/29

TITLE: Temperature Dependence of Spectral Composition of  
Luminescence of Zinc Cadmium Sulphide

PERIODICAL: Československý časopis pro fyziku, 1959, Nr 3, pp 246-248

ABSTRACT: The width of the broad, roughly gaussian, emission bands of sulphide phosphors should be proportional to the absolute temperature or its square root. Results by Schön (Ref 1) and Klick (Ref 2) are, however, not in good agreement with this assumption. In the present investigation, a phosphor containing 70% ZnS, 30% CdS:0.01 Ag was deposited without binder on an aluminium substrate, cooled to liquid air temperature and then warmed up in steps of roughly 20 °C. At each temperature the emission spectrum was measured. Excitation was mainly by radiation of 365 mμ wavelength. Figure 1 shows the emission spectrum at 110 and 220 °K. The maximum has shifted and decreased with temperature but the width of the curve has remained nearly unchanged. Figure 2 shows the logarithm of the emission intensity against temperature for several selected wavelengths. In agreement with other measurements (Peyrou and others - Refs 3,4), these measurements show a decrease in the maximum

Card1/3



CZECH/37-59-3-4/29

**Temperature Dependence of Spectral Composition of Luminescence of Zinc Cadmium Sulphide**

intensity with increasing temperature and a shift towards shorter wavelengths. This behaviour can be understood on the assumption that the emission centre consists of a sulphur ion whose energy levels are shifted by the influence of activator ions in its vicinity (H.A. Klasens - Ref 8). By thermal expansion of the lattice the distance between the sulphur ion and the activators increases; thereby the interaction decreases and the relevant energy level approaches its original position in the valence band. Thus, the emission shifts towards shorter wavelengths. On the other hand, the migration of holes increases with temperature (the author - Ref 9) and tends to shift the emission towards longer wavelengths. The balance between these two influences may vary in different materials (C.C. Vlam - Ref 10 and J. Ludwig, R. Seiwert - Ref 11). Traps may also influence this process (Refs 12, 13). A further investigation regarding the possibility of the influence of traces of copper is in progress.

Card2/3

✓

CZECH/37-59-3-4/29  
Temperature Dependence of Spectral Composition of Luminescence of  
Zinc Cadmium Sulphide

There are 2 figures and 13 references, 5 of which are  
German, 1 French, 2 international, 3 Czech and 2 English.

ASSOCIATION: Výzkumný ústav pro vakuovou elektrotechniku, Praha  
(Research Institute for Vacuum Electrical Technology,  
Prague)

SUBMITTED: July 14, 1958

Card 3/3

✓

SOUDEK, I

Distr: 4Elx(g)/4E2d(b) 2 oys

✓ investigation of the photoelectric phenomena of luminescing zinc-cadmium sulfides; Ivan Soudek (Research Inst. Vacuum Electronics, Prague). Czechoslov. J. Phys. 9,590-8(1959)(in German).—S. observes that Cu addn. leads to increased polarizability and a change in the real part of the dielec. const.; the effect occurs even at Cu concns.(about  $10^{-4}$ ) which have no influence on luminescence; Ni suppresses the effect of Cu. The spectral measurements indicate loss max. in the infrared. The excitation max. in the absorption tail also depend on the real part of the dielec. const.  
A. Kremheller

4  
1-Joff(LWP)  
1-KK(MS)  
1-ISP(C)  
3

SOUDEK, I.

1- Influence of temperature on the spectral composition of the zinc sulfide luminescence. I. Soudek (Research Inst. Vacuum Electronics, Prague), *Phys. J. Appl. Phys.*, 11, 280-92 (1960).—Research on the temp. dependence of the main emission bands of phosphors of the ZnS type show that the form of the bands undergoes only small changes which are difficult to connect with any theory. To examine the effect thoroughly, spectral curves were measured, in steps of 20–30°, of phosphors cooled with liquid air and subsequently elec. heated to the temp. breakpoint. The spectral compn. of the luminescence was measured by means of a spectrophotometer composed of a glass prism monochromator and a photomultiplier; a Hg discharge tube with a Wood's filter bulb served as the exciting source. The log of the intensity of luminescence for a limited no. of selected wave lengths is plotted as a function of the temp. These results show: (a) that below 180°K. the short-wave side of the emission band of all phosphors grows faster than the long-wave length side with increasing temp.; (b) that in the neighborhood of 220°K. the intensity of the whole band has a min. for all Cu-activated and Cu-contaminated phosphors; and (c) that above 220°K. some phosphors exhibit a behavior exactly opposite that of (a). These results cannot be explained by a simple temp.-dependent change of the absorption coeff. and of  $n$  of the base material. A theory to explain them, based on the existence of 2 temp.-dependent processes with inverse influence on the form of the emission band, is presented and discussed. Robert T. O'Connor

24.3500

hhhh8  
Z/028/62/000/006/003/003  
D236/D308

AUTHOR: Soudak, Ivan

TITLE: A polarizer for infrared radiation

PERIODICAL: Pokroky matematiky fyziky a astronomie, no. 6, 1962,  
354

TEXT: A new polarizer has been developed at the Zeiss Works in Jena. It works by reflection from selenium foils of a thickness of a few microns. It is intended for wavelengths between 2 - 25  $\mu$ , wave numbers from 5000 to 400  $\text{cm}^{-1}$ . In this region the transmission is almost constant around 40%, and the degree of polarization is 98%.

[Abstracter's note: Complete translation] ;

Card 1/1

SOUDEK, Ivan

Electromotors with printed winding. Pokroky mat fyz astr 7  
no. 4:236 '62.

SOUDEK, Ivan

Absolute measurement of the power of an electromagnetic field. Pokroky  
mat fyz astr 7 no.5:283 '62.



SOUDEK, Ivan

An interesting method for generating the infra-acoustic frequencies.  
Pokroky mat fyz astr 7 no.5:283 '62.

SOUDEK, Ivan

Air cushion railroad cars. Pokroky mat fyz astr 7 no.6:354  
'62.

SOUDEK, Ivan

Television in railroad operation. Pokroky mat fyz astr 7  
no.6:354 '62.

SOUDEK, Ivan

Use of laboratory interferometer for growing champignons.  
Pokroky mat fyz astr 7 no.6:354 '62.

SOUDEK, Ivan

Lighting discharge tubes without series elements. Pokroky  
mat.fyz astr 7 no.6:359 '62.

SOUDEK, Ivan

"Measurement in industries" by [inz., dr.] Václav Sindelar.  
Reviewed by Ivan Soudek. Pokroky mat fyz astr 7 no.6:367  
'62.

SOUDEK, Ivan

"Protection from contact voltage" by [inz.] Jaroslav Richter.  
Reviewed by Ivan Soudek. Pokroky mat fyz astr 8 no.2:97 '63.

SOUDEK, I.

Problem of the temperature dependence of photographic emulsion luminescence. Chekhosl fiz zhurnal 13 no.3:231-232 '63.

1. Fyzikalni ustav Karlovy university, Praha.



~~SOUDEK, Ivan~~

Ferromagnetic graphite. Pokroky mat fyz astr 8 no.2:88 '63.

SOUDEK, Ivan

Ultrasonic device for defect searching. Pokroky mat fys astr  
8 no.2:80 '63.

SGUDEK, Ivan

Our internal clock; physiological test. Pokroky mat fyz astr 8  
no.2:88 '63.

SOUDEK, Ivan

Motor boat with reaction drive. Pokroky mat fys astr 8 no.2:97 '63.

SOUDEK, Ivan

How many colors are there? Pokroky mat fyz astr 8 no.4:241  
'63.

SOUDEK, Ivan

Electromotors with printed armature winding. Pokroky nat fyz  
astr 8 no.4:247 '63.

SOUDEK, Ivan

Use of air-cushion vehicles. Pokroky nat fys astr 8 no.4:227 '63.

SOUDEK, Ivan

Kaleidoscope in technology. Pokroky mat fyz astr 8 no.5:286-  
'63.



SOUDEK, Ivan

Why plastics are used in rockets? Pokroky mat fyz astr 8 no.5:  
290 '63.

How long does infinity last? 290

Properties of ruby lasers. 290

Large underground gasholder. 290

"Luminescence" by [CSc.] Karel Patek. Reviewed by Ivan Soudek.  
295 <sup>Ac</sup>

"Lightning protection" by [ins.] Ivan Sevcov. Reviewed by Ivan  
Soudek. 297

SOUDEK, Ivan

Transistor multimeter. Pokroky mat fyz astr 8 no.6:331	'63.
Ultrasonic radar for blind people.	331
Electroluminiscent pressure gauge.	331
Miniature silica watch.	331
Semiconductor household refrigerator.	331
Thermoelement batteries.	342
Cooling on the basis of the Peltier effect.	342
A watch without moving parts.	342
A liquid laser.	342

SOUDEK, Ivan

"Principles of automation" by [inz] Bruno Bosek. Reviewed  
by Ivan Soudek. Pokroky mat fyz astr 8 no.6: 359 '63.

"Automation of measurements" by Vaclav Sindelar. Reviewed  
by Ivan Soudek. 359-360

"Electricity and safety" by [inz] Frantisek Soukup. Reviewed  
by Ivan Soudek. 360

SOUDEK, Ivan

Photoelectric cells in automobiles; Telephone with television;  
Automatic control of rail vehicles; Picture tube with miniature  
signals. Pokroky mat fyz astr 8 no.3:144 '63.

Photomultipliers without bulbs; Color television in the Soviet  
Union. Ibid.:159

Astronomical telescopes of Galileo Galilei. Ibid.:172

Production of semiconductor elements in Bulgaria; Tires with  
exchangeable tread. Ibid.:179

SOMER, Ivan

How is silver used? Pokroky mat fiz astr 9 no.4:239 '64.

Magnetic reproduction of television pictures. Ibid.: 243

Experimental boiler for extreme steam parameters. Ibid.: 247

Agreement between the Soviet Union and the United States on cooperation in the field of artificial satellites. Ibid.: 250

High vacuum similar to the Torricellian vacuum. Ibid.: 250

Emission of television image on several channels. Ibid.: 250

Instruction of locomotive engineers by analog computers. Ibid.:

SOUDEK, J.

Measurement of physical-optical properties in luminescent materials. p. 55.

(Jemna Mechanika A Optika. Vol. 2, no. 2, Apr. 1957. Praha, Czechoslovakia)

SO: Monthly List of East European Accessions (EEAL) LC, Vol. 6, no. 10, October 1957. Uncl.

CZECHOSLOVAKIA/Chemical Technology - Chemical Products and  
Their Application, Part 3. - Fermentation Industry.

H-26

Abs Jour : Ref Zhur - Khimiya, No 7, 1958, 22988

Author : J. Soudek, D. Petricek

Inst :

Title : Chemical Methods of Hops Evaluation.

Orig Pub : Chmelarstri, 1957, 30, No 9, 139-140

Abstract : The Velimer method, based on the difference in the solubility of individual components of the bitter substances of hops in various organic solvents, is the fundament of the chemical investigation. The total amount of resins, soft resins,  $\alpha$ -acid (humulone),  $\beta$ -acid (lupulone) and solid resins is determined by this method.

Card 1/1

SOUDEK, Jiri, promovany chemik

Waste water from ore dressing plants. Rudy 10 no.5:167-169  
My '62.

1. Ustav pro vyzkum rud, Pribram.



BENA, J., dr.; SOUDEK; MALEC, Zd.; STAREK; MICHALICA, Karel, inz.;  
HUSA, V., inz. dr., ScC.; KRIZ, J.

Reports. Slaboproudý obzor 24 no.7:423-428 JI '63.

SOUDKOVA, Milose  
SOURCE, Given Names

Country: Czechoslovakia

Academic Degrees: Dr

Affiliation: Psychological Laboratory, SAV /Slovenska akademie ved; Slovak  
Academy of Sciences/ (Psychologicke laboratorium SAV), Brati-  
slava

Source: Bratislava, Nasa Veda, Vol VIII, No 9, 1961, pp 527-531.

Data: "Psychological Problems in Teaching."

GPO 981643

SOUKHOVA, Vera, MUDr.

Leptospirosis in children.  
Cesk. pediat. 11 no.1: 36-41 Feb 56.

1. Interni oddeleni KDH v Brne, prednosta doc. MUDr. O. Saxl  
(LEPTOSPIROSIS, in inf. and child  
case reports)

89745

Z/035/60/000/011/001/001  
D007/D102

5.5310

AUTHORS: Soudný, Mojmir, Engineer, and  
Malínek, Miroslav, Candidate of Chemical Sciences

TITLE: Spectrographic determination of indium in flue dust

PERIODICAL: Rudy, no. 11, 1960, 380 - 382

TEXT: The article describes spectrographic tests with the constant-temperature-arc method to determine indium in flue dust. The tests were performed with the aim of finding a rapid method by which metallurgical flue dust can be analyzed for its suitability as a raw material source of rare metals. There are several methods of spectrographic determination of In, but most of them are explicit methods developed for analysis of specific materials, such as sphalerite, galena and mica, as described by A. I. Busev (Ref. 1: *Analyticheskaya khimia india* [Analytical Chemistry of Indium] Izdatelstvo akademii nauk SSSR, Moscow, 1958). However, since the composition of flue dust varies, a method had to be found which would be independent of both qualitative and quantitative changes of the main compo-

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Z/035/60/000/011/001/001

DOO7/D102

Spectrographic determination of indium...

nents of samples. Several attempts were made to eliminate the influence of "third components" on the spectralline intensity of indium. A so-called constant-temperature-arc method, developed by N. W. H. Addink, J. A. M. Dikhoff, C. Schipper, A. Witmer and T. Groot (Ref. 15: Spektrochim. Acta 7, 45, 1956; Ref. 16: Applied Spectroscopy 10, 128, 1956), where the sample is placed in the crater of a heavy carbon electrode and then completely burned by the arc, was successfully applied for the determination of germanium by M. Malínek (Ref. 17: Applied Spectroscopy, 13, 1, 1959). The same method was now tested for its suitability to analyse indium in flue dust. The tests were performed with a "KSA 1" high-dispersion spectrograph with quartz lenses, with d/c supplied from a "U 300/20 R 30" electronically-controlled rectifier, a product of the n.p. Křižík Děčín (Křižík National Enterprise, Děčín). "Foma Spektro Modrá 220" and "Agfa Blau Hart" photographic plates and Kodak "D19" and "F5" chemicals were used for photographic processing. Electrodes were made of graphite rods, supplied by the n.p. Elektrokarbon Bratislava (Elektrokarbon National Enterprise, Bratislava) which had to be machined to the

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Spectrographic determination of indium...

89745

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D007/D102

shape shown in Figure 1 to achieve quiet burning of the arc. Since the used graphite was originally not meant for this purpose, spectrographic purity could not be achieved, despite chemical and physical purification. The emulsion was calibrated not only with respect to the contrast factor (gamma), but also in regard to the dependence between the actual intensity of the source and the optical density for a certain wave length region. Complete burning of 5 mg  $\text{Co}_2\text{O}_3$  was used as light-intensity standard, with the intensity scale given by a 7-stage filter. To cover the entire range of optical densities, from the lowest values of the background to the highest In concentrations, two lines of different intensity, namely Co I 3039.57 and Co I 3042.48 were chosen for constructing the calibration curves (Fig. 2). From the last 4 In lines, the line In I 3039.356, designated U-4 in Harrison tables (Ref. 20: G. R. Harrison: M. I. T. Wavelength Tables. John Wiley & Sons, New York, 1939), was chosen (Fig. 3), since the other three are not suitable for the constant-temperature-arc method. For the dispersion and resolving power of the used instrument, a disturbing influence could be expected only from Fe at a concentration of 25% and more, and from Cd at a concen-

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Z/035/60/000/011/001/001  
D007/D102

Spectrographic determination of indium...

tration of 10% and more. However, neither element occurs in such high concentration in the flue dust. The tests were performed under the following conditions: Adjusted wavelength, 3,000 Å; slit width, 0.025 mm; voltage (source not loaded), 300 V; current (with electrodes in contact), 15.5 A; loading resistance in series with the arc, 25 ohms; electrode gap, 9 mm; weight of sample in the anode, 5 ± 0.1 mg; arc ignition by electrode contact; exposure time till complete burning of the sample (5 - 6 minutes). Densitometric data was obtained at 30 X magnification and a slit width of 0.45 mm. The current was not regulated during exposure, but the rated electrode gap was maintained constant. The time of complete sample burning was determined from spectrograms developed in time. Dry, finely-ground samples were placed in the anode crater and covered by 5 mg SiO<sub>2</sub> and some graphite. Four samples of equal composition were exposed on one plate, together with the reference Co spectrum. A calibration curve was drawn for each plate. The percentage of In in the sample was read from the curve after calculating the actual intensity by subtracting the background intensity from the total intensity. The assumption that the influence of major components of the sample can

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be ignored was verified by total burning of various synthetic 5 mg standards with the same content of In, but with varying matrices containing PbS, ZnS, SnO<sub>2</sub>, As<sub>2</sub>O<sub>3</sub>, Sb<sub>2</sub>S<sub>3</sub>, CuS, Al<sub>2</sub>O<sub>3</sub> and SiO<sub>2</sub>. The intensity of the In 3039 line fluctuated only within limits permissible by the method. For construing the analytical curve, synthetic standards were prepared by mixing the basic In standard, containing 0.1% In, with a matrix of approximately the same composition as found in flue dust. The corrected In 3039 line intensities are plotted versus In % in logarithmic scale in Figure 4. From 0.001% (threshold sensitivity) to 0.03% In the curve is a straight line; above 0.03% the influence of self-reversal begins asserting itself. In conclusion, the authors state that the tests proved the suitability of the constant-temperature-arc method for spectrographic determination of In in flue dust. The reproducibility of the method was determined by frequently repeated tests. The mean square error was found to be  $\pm 13\%$ . The good agreement of results obtained by the described method with those obtained by chemical analysis is shown in Table 1. The time required for analysis is less than 1 hour. The accuracy is considered adequate in view of the more complicated and tedious chemical methods

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100 ml. of 25% NH<sub>4</sub> and 10 ml. of 10% KCN soln. Stir,  
dil. with 250 ml. H<sub>2</sub>O, and filter. Weigh the ppt. after  
ignition to Ag. NH<sub>4</sub>SCN, cyanamide, cyanoguanidine,  
urea, (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>, and (NH<sub>4</sub>)<sub>2</sub>CO<sub>3</sub> do not interfere.  
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